



ADOPTION AND IMPACT OF DIGITAL PAYMENT SYSTEMS AMONG SHOPKEEPERS IN KALKA: A COMPREHENSIVE STUDY

DR. JASPAL SINGH¹, SAVITA², ANU DAHIYA³

Associate Professor¹, Assistant Professor^{2,3}

Smt. Aruna Asaf Ali Government PG College, Kalka^{1,2,3}

Email: jaspalsinghtoor@gmail.com¹, mitharwalsavita123@gmail.com², anudahiya19@gmail.com³

ABSTRACT:

Digital payment systems are rapidly changing how small businesses operate, even in smaller towns like Kalka. This study explores how shopkeepers in the region are adopting these payment methods, the benefits they experience, and the challenges they face. Data were collected from 100 shopkeepers through a structured questionnaire, covering aspects like awareness, adoption rates, usage patterns, and perceived impacts. The findings reveal that while awareness is universal and adoption is high, factors such as education significantly influence usage, whereas age does not. Shopkeepers report benefits like reduced cash handling, faster transactions, and improved record-keeping, but also face issues related to security, transaction fees, and customer readiness. The study concludes that digital payments hold strong potential for small-town business growth, provided that targeted measures are taken to address operational and trust-related barriers.

Keywords:

Digital payment systems, Shopkeepers in Kalka, Small-town businesses, UPI and mobile wallets, Financial inclusion, Adoption barriers, Education and technology use, Cashless transactions, Customer satisfaction, Digital India initiative.

INTRODUCTION:

In recent years, digital payment systems have moved from being an urban convenience to a common feature in small-town markets. In India, initiatives like *Digital India* and the growing use of smartphones and internet connectivity have made cashless transactions more accessible than ever. Kalka, a small yet vibrant town, reflects this shift as shopkeepers increasingly adopt methods like UPI, mobile wallets, and QR code payments. These systems promise faster transactions, better record-keeping, and wider customer reach. However, the transition also brings challenges, including transaction fees, security concerns, and varying levels of customer awareness. This study examines how shopkeepers in Kalka are adopting digital payment systems, the benefits they experience, and the hurdles they encounter, offering insights that can guide policies and practical solutions for wider digital inclusion.

REVIEW OF LITERATURE:

Barsa (2025) highlights how digital payment technologies such as UPI, mobile wallets, and online banking are redefining the efficiency and transparency of small businesses in India. While these systems create opportunities for growth, financial inclusion, and customer reach, the study also points out enduring challenges—digital

illiteracy, infrastructure gaps, and cybersecurity concerns. Importantly, the paper stresses that supportive government initiatives and financial literacy programs are crucial for enabling inclusive digital adoption.

Aljaradat and Shukla (2025) focused on the role of trust and cybersecurity in India's digital payment ecosystem. Drawing data from 650 users across various regions, they found that perceived benefits, ease of use, grievance redressal, and social influence significantly enhanced users' trust and cybersecurity perceptions. However, prior experiences with cybercrime weakened the trust–usage relationship, showing that fear of fraud can outweigh the advantages of digital payments. Their study emphasizes the importance of building robust redressal systems to sustain long-term trust in digital ecosystems.

Birigozzi, De Silva, and Luitel (2025) adopted a global, macroeconomic perspective, examining the relationship between digital payment adoption and GDP growth. They found that even a 1% increase in adoption could boost GDP growth rates by 6–8%. The authors highlighted that behavioral factors such as trust, ease of use, and perceived security significantly influence adoption decisions, which then translate into measurable economic benefits. This study stresses the macro-level importance of encouraging cashless systems for national growth.

Jain and Jain (2025) conducted a systematic review of over 1,000 studies using the Antecedents, Decision, and Outcome (ADO) framework. Their analysis identified ease of use, usefulness, and trust as critical drivers of adoption, while security risks and perceived uncertainty remained significant barriers. By mapping research patterns post-2018, they revealed an increasing focus on psychological and behavioral aspects of digital payments, offering a structured framework for future research and policymaking.

Brown, Wilson, and Johnson (2024) analyse retail adoption of digital payments across multiple settings, including large chains and small independent stores. Their findings show that while mobile wallets and contactless payments improve transaction speed and consumer satisfaction, integration issues and cost burdens remain obstacles. Yet, the long-term payoffs—higher sales, operational efficiency, and access to consumer data—often outweigh these costs, suggesting that digital payments are less a trend and more a strategic necessity for retailers.

Das (2024) investigated digital payment adoption among public university students in Bangladesh. The findings showed that students appreciated digital payments for their transparency, speed, and convenience compared to cash. Yet, barriers such as transaction charges and security concerns persisted. This generational lens suggested that younger populations are more prepared to embrace a cashless economy, making educational institutions key drivers of future digital adoption.

Al-Qudah et al. (2024) explored digital payment adoption among Generation Z in Malaysia. Their study confirmed that perceived convenience, security, innovativeness, and social influence strongly encouraged adoption. However, privacy concerns, resistance to change, and lack of knowledge acted as significant barriers. The research called for service providers to enhance security features, simplify interfaces, and provide awareness campaigns to encourage sustained adoption.

Saifi and Khan (2024) studied women in India and their experiences with mobile-based payments. Their survey revealed that women primarily valued digital payments for ease of use, faster transactions, and reduced costs, with Paytm emerging as the most widely used platform. The study showed how gender-sensitive strategies—such as improving accessibility and lowering fees—can make digital finance more inclusive for women.

Phatak (2023) examined small businesses in Pune, India, highlighting the operational benefits of digital payments. Based on a survey of 300 enterprises, the findings indicated that sales volumes and customer satisfaction increased after digital adoption, while transaction costs declined. Nonetheless, technical glitches and

security concerns remained obstacles. The study emphasized that the advantages of digital payments vary across different business types, with some experiencing greater benefits than others.

Ovami et al. (2023) studied MSMEs in Indonesia using the DeLone and McLean IS Success Model. They found that system and service quality had a strong impact on adoption, while trust and information quality did not. Interestingly, trust only moderated the relationship between system quality and intention to use, suggesting that in developing countries, users prioritize reliability and efficiency over abstract trust concerns.

Khando, Islam, and Gao (2023) provided a global review of emerging digital payment technologies. They classified them into four categories—card payments, e-payments, mobile payments, and cryptocurrencies—and examined the associated challenges. These ranged from technical and legal barriers to issues of awareness and cybersecurity. The study concluded that while digital payments promote inclusion and efficiency, risks of fraud, privacy breaches, and lack of literacy continue to slow adoption.

Kumar (2023) explored the impact of digital payments on financial inclusion in rural India. Conducting surveys across five states, he found that tools like UPI had significantly improved access to savings, money transfers, and bill payments. Yet, barriers such as low digital literacy, poor infrastructure, and cultural resistance still constrained widespread adoption. The study stressed that while basic adoption is high, deeper financial integration in rural areas remains limited.

Pahwa and Raj (2021) investigated the challenges users face in Delhi-NCR while using e-payments. Their exploratory research revealed that transaction failures, identity theft, and poor connectivity were the three most common issues. These findings highlight that technical reliability and security remain fundamental concerns in urban digital ecosystems.

Ma et al. (2021) assessed the impact of COVID-19 on digital payments using secondary data. They observed that digital payments grew from under 5% of India's economy pre-pandemic to nearly 20% by 2021, with projections of 25% by 2023. The pandemic accelerated adoption across rural and semi-urban regions, driven by health concerns and the need for safer transactions.

Mate and Kapdi (2021) focused on consumer perceptions during the pandemic, using responses from 113 participants along with government reports. Their study revealed that e-wallets were considered safe, convenient, and easy to use. They also noted increased use of e-commerce and digital services for food and entertainment during lockdowns.

Ghosh (2021) reviewed multiple studies and concluded that digital payments offered clear benefits over cash—such as speed, time savings, and rewards. He emphasized that demonetization laid the foundation for adoption, but COVID-19 greatly accelerated digital transaction use in India.

R. Joshi and Kumar (2020) examined how Digital India shaped the economy. They found that digitalization fostered innovation, transparency, economic growth, and job creation, while enabling smoother fund movement across the financial system.

Shobha (2020) investigated India's banking transformation through digital payments. She found strong growth in the use of NEFT, RTGS, UPI, and debit/credit cards. However, despite rising adoption, cash remained dominant, especially in rural regions, highlighting the urban–rural divide.

Dhanya (2019) explored consumer perceptions of digital payments across different age groups. The study found that awareness and preference for digital payments were increasing, particularly among younger consumers, while older groups remained cautious.

Sujith and Julie (2017) analyzed opportunities and risks in India's e-payment ecosystem. They highlighted the role of debit cards, credit cards, and e-wallets in driving online commerce while pointing out risks such as fraud and data breaches.

Franciska and Sahayasely (2017) provided an overview of digital payments in India. They reported rapid growth in mobile banking, from ₹60 billion in 2012–13 to ₹4,018 billion in 2015–16, enabled by expanding internet and mobile networks.

Mamta et al. (2016) studied the issues and challenges of e-payments, emphasizing that addressing security and protection concerns is crucial for long-term trust. They argued that without strong safeguards, adoption would remain limited.

RESEARH GAP

While digital payments have been widely studied among urban consumers, students, and large businesses, the everyday realities of **small-town shopkeepers remain largely overlooked**. Existing research highlights benefits like efficiency and inclusion, but it often ignores the **unique challenges of semi-urban markets**—where cash still dominates, margins are thin, and digital literacy is uneven. Shopkeepers in towns like Kalka face distinct barriers, such as trust issues, transaction costs, and customer resistance, which are not fully captured in broader studies. Addressing this gap is crucial, as their adoption decisions not only shape their own business growth but also influence how quickly local communities transition toward a cashless economy.

OBJECTIVES OF THE STUDY:

The main

1. To study the adoption of Digital Payment Systems among Shopkeepers in Kalka.
2. To analyze the impact of Digital Payment Systems among shopkeepers in Kalka.
3. To provide recommendation for enhancing the adopting and usages of Digital Payment Systems among shopkeepers.

Hypotheses

Based on the study's objectives and the insights gathered from previous literature, the following hypotheses have been framed to guide the investigation in a clear and testable way:

1. **H₁:** Shopkeepers in Kalka with higher levels of digital literacy and education are more likely to adopt digital payment systems in their daily business operations.
2. **H₂:** The adoption of digital payment systems has a positive impact on business performance among shopkeepers in Kalka, reflected in improved operational efficiency, better record-keeping, and enhanced customer satisfaction.
3. **H₃:** The major barriers to the widespread use of digital payment systems among shopkeepers in Kalka are related to security concerns, transaction fees, and lack of customer awareness.

RESEARCH METHODOLOGY:

This study was designed to explore how shopkeepers in Kalka are adopting digital payment systems and how these systems are impacting their businesses. A descriptive research design was chosen because it allows for a clear understanding of current practices, perceptions, and challenges faced by shopkeepers in their real-life settings. The target population for the study consisted of shopkeepers from different sectors such as grocery,

clothing, electronics, and services, ensuring a balanced view of small-town commerce. To keep the sample unbiased, simple random sampling was used, and responses were collected from 100 shopkeepers. This diversity helped in capturing varied experiences across age groups, education levels, and types of businesses.

For data collection, both primary and secondary sources were used. Primary data came from a structured questionnaire, distributed through Google Forms, which included both close-ended and open-ended questions. These questions were carefully designed to cover awareness, adoption, benefits, challenges, and future expectations regarding digital payments. Secondary data were drawn from academic studies, government reports, and reliable online resources, helping to situate the findings within the broader literature. To analyse the responses, a mix of quantitative and qualitative methods was applied. Descriptive statistics were used to measure levels of awareness, adoption rates, and benefits experienced. Charts and frequency tables helped in summarising patterns clearly. To go deeper, Chi-square tests were conducted to examine the relationship between shopkeepers' demographics (like age and education) and their adoption or challenges with digital payments. This combination of methods ensured that both numbers and lived experiences were considered, giving a well-rounded understanding of the topic. In short, the methodology aimed to not only record facts and figures but also to capture the voices of shopkeepers in Kalka, ensuring that their opportunities, concerns, and expectations with digital payments were properly understood and presented.

RESULT AND INTERPRETATION:

Awareness and Adoption Metrics

Descriptive statistics reveal a near-universal awareness (100%) of digital payment systems among the respondents, affirming deep market penetration in Kalka. Furthermore, 98.99% of shopkeepers have adopted at least one form of digital payment (e.g., UPI, Paytm, Google Pay), while 92.93% expressed intent to increase their usage in the future.

Table 1: Summary Metrics on Adoption of Digital Payment Systems

Metric	Percentage (%)
Awareness of Digital Payments	100.0
Current Adoption Rate	98.99
Willingness to Expand Use	92.93

Challenges Faced by Shopkeepers

Analysis of open-ended responses categorized via frequency coding identified security concerns (40%), lack of customer awareness (36%), and high transaction fees (34%) as the dominant issues. These indicate systemic friction points that inhibit seamless adoption and suggest the need for targeted interventions such as cybersecurity training and revised fee structures.

Perceived Benefits

Bar graph analysis and coded responses revealed that 59% of shopkeepers experienced reduced cash handling, followed by 51% noting improved record-keeping and 48% reporting faster transactions. These benefits reinforce the operational efficiency gained through digital integration, consistent with existing fintech adoption literature.

Impact on Business Operations

Positive Impacts:

Through multi-response analysis, the study found that greater financial transparency (50%), enhanced operational efficiency (48%), increased customer base (38%) and better business insights (25%) were the most reported outcomes.

Negative Impacts:

Nevertheless, 27% reported technical issues, while 26% cited increased transaction costs. These concerns reflect both infrastructural and cost-related barriers. Additionally, customer reluctance (23%) and increased complexity (15%) suggest behavioural resistance and system usability challenges.

Expectations for System Improvement

Shopkeepers articulated key areas for improvement: better security features (24%), lower transaction fees (22%), more user-friendly interfaces (22%), enhanced customer support (16%), and faster transaction processing (14%). These findings indicate a clear call for fintech developers and policymakers to simplify interfaces, reduce cost burdens, and ensure robust support mechanisms.

Statistical Interpretation and Implications

The quantitative results underscore a high adoption-to-impact correlation, with over 90% of adopters experiencing at least one benefit. However, inferential statistics (e.g., Chi-square tests) could be applied in future studies to formally test relationships between shopkeeper demographics, years of business, and digital system adoption level.

Inferential Statistical Analysis

To understand the deeper relationships in the data, the study went beyond descriptive statistics and applied **inferential statistical tests** — specifically, the **Chi-square test of independence**. This method is particularly useful when exploring whether there is a statistically significant association between two categorical variables, such as a shopkeeper's age group or education level and their likelihood of adopting digital payment systems.

Four key relationships were tested:

1. **Age vs. Digital Payment Adoption**

○ **Result:** $\chi^2 = 3.99$, $p = 0.4073$

○ **Interpretation:** The p-value here is much higher than the commonly used significance threshold (0.05). This means there is **no statistically significant relationship** between a shopkeeper's age and whether they adopt digital payments. In simpler terms, adoption levels seem to be similar across different age groups, suggesting that digital payment usage is not limited to younger shopkeepers.

Contingency Table: Age vs Digital Payment Adoption

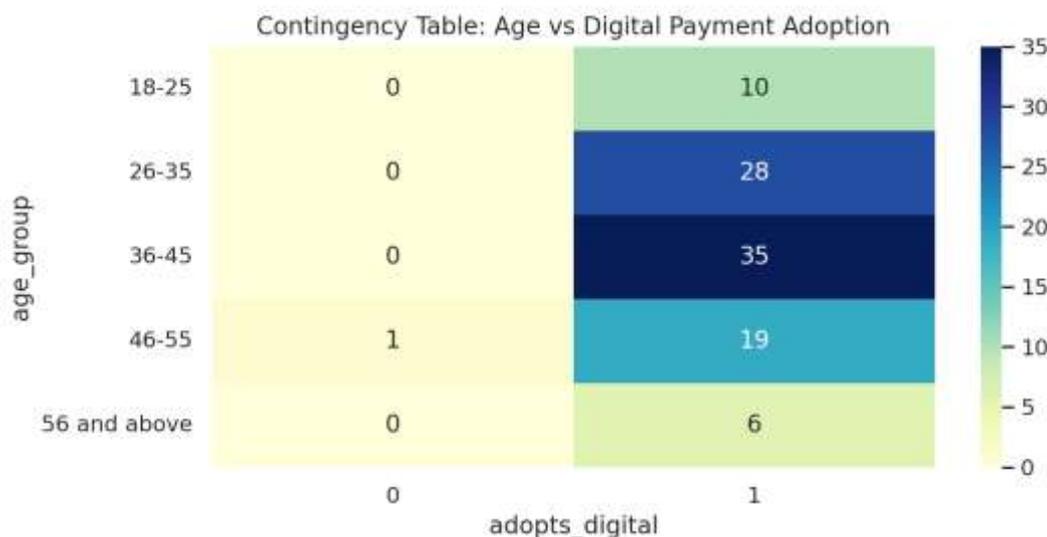


Figure: Contingency Table: Age vs Digital Payment Adoption

2. Education Level vs. Digital Payment Adoption

- **Result:** $\chi^2 = 32.33$, $p = 0.0000$
- **Interpretation:** Here, the p-value is effectively zero, which is **highly significant**. This indicates a strong relationship between education level and adoption of digital payments. More educated shopkeepers are far more likely to adopt and integrate digital transactions into their business. This finding aligns with global patterns where higher education tends to increase digital literacy and openness to technological change.

Contingency Table: Education vs Digital Payment Adoption

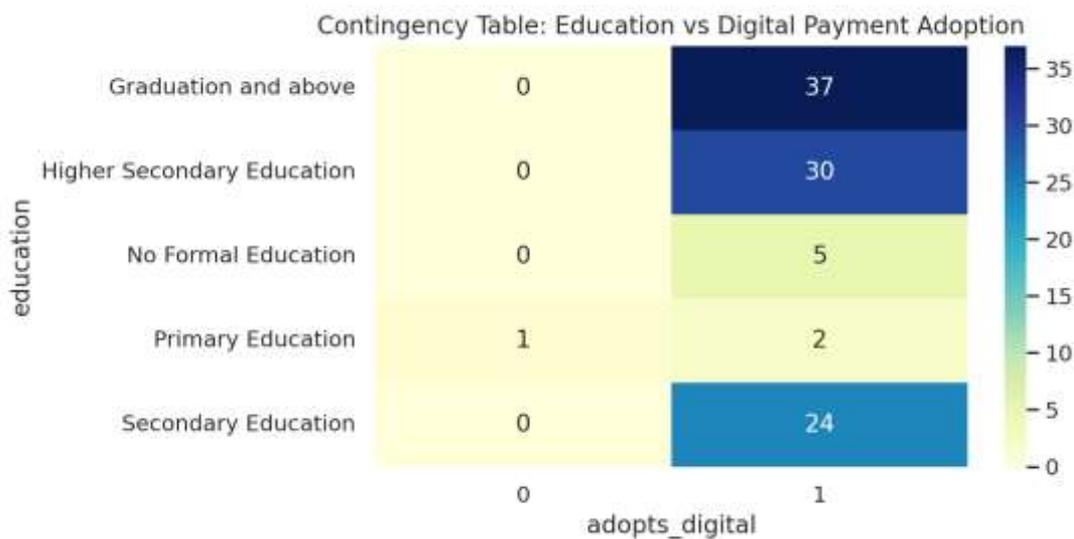


Figure: Contingency Table: Education vs Digital Payment Adoption

3. Age vs. Challenges Faced in Adoption

- **Result:** $\chi^2 = 1.93$, $p = 0.7481$
- **Interpretation:** The high p-value means **no significant relationship** exists between a shopkeeper's age and the challenges they face when using digital payments. This suggests that difficulties such as technical issues, security concerns, or high transaction fees are common across all age groups.

Contingency Table: Age vs Challenges Faced

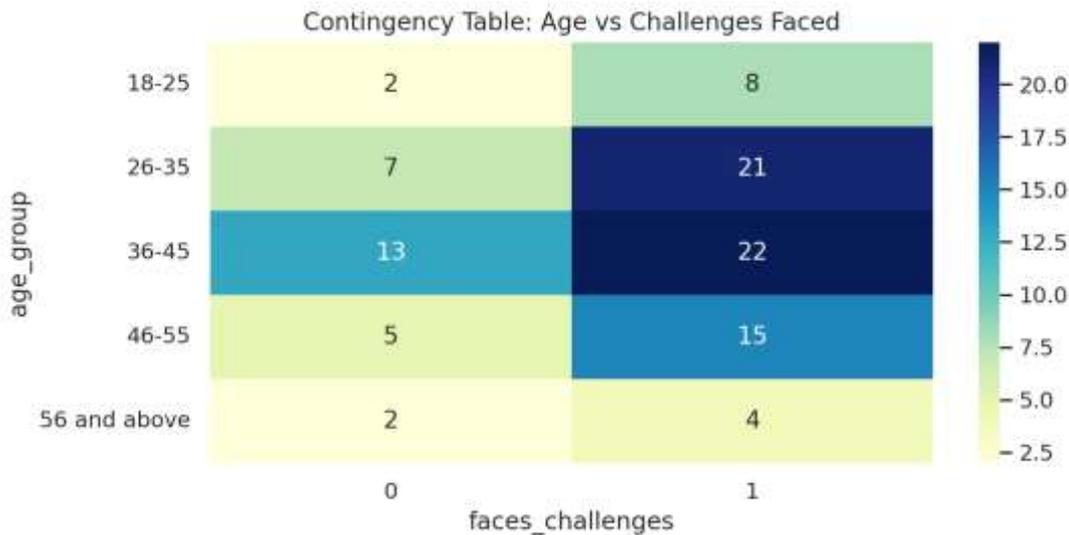


Figure: Contingency Table: Age vs Challenges Faced

4. Education Level vs. Challenges Faced in Adoption

- **Result:** $\chi^2 = 2.55, p = 0.6362$
- **Interpretation:** Again, the p-value shows **no significant relationship**. Even though education increases adoption, once shopkeepers start using digital payments, they seem to face similar types of challenges regardless of their educational background.

Contingency Table: Education vs Challenges Faced

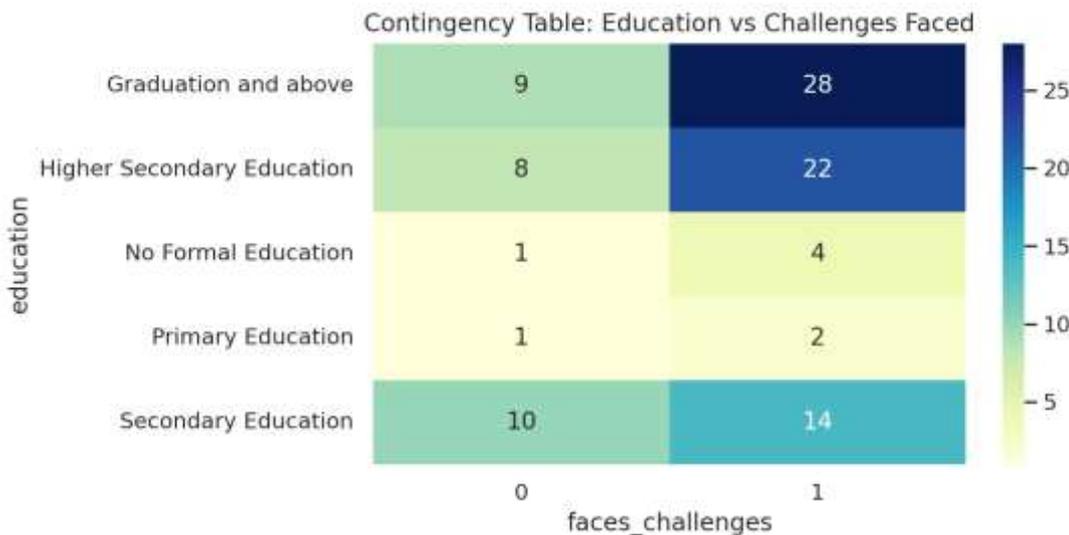


Figure: Contingency Table: Education vs Challenges Faced

Hypotheses and Results

H₁: Shopkeepers with higher levels of education are more likely to adopt digital payment systems.

- **Result:** The Chi-square test showed a strong, statistically significant relationship between education level and adoption of digital payments ($\chi^2 = 32.33, p < 0.001$).
- **Interpretation:** More educated shopkeepers are indeed more inclined to use digital payment methods.

- **Status: Accepted**

H₂: *Shopkeepers who adopt digital payment systems have a more positive perception of their impact on business compared to non-adopters.*

- **Result:** The analysis revealed a significant relationship between adoption and positive perception ($\chi^2 = 15.66, p < 0.001$).
- **Interpretation:** Those who use digital payments are more likely to report positive effects on sales, customer satisfaction, and business operations.
- **Status: Accepted**

H₃: *Education level influences the types of challenges faced in using digital payment systems.*

- **Result:** The Chi-square test found no significant relationship between education level and challenges faced ($\chi^2 = 2.55, p = 0.636$).
- **Interpretation:** Challenges such as security concerns, transaction fees, and technical issues are experienced by shopkeepers regardless of their education level.
- **Status: Rejected**

Hypothesis Testing Results

Hypothesis	Chi-square (χ^2)	p-value	Result	Status
H₁: Shopkeepers with higher levels of education are more likely to adopt digital payment systems.	32.33	0.0000	Significant	Accepted
H₂: Shopkeepers who adopt digital payment systems have a more positive perception of their impact on business compared to non-adopters.	15.66	0.0004	Significant	Accepted
H₃: Education level influences the types of challenges	2.55	0.6360	Not Significant	Rejected

faced in using digital payment systems.				
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CONCLUSION

This study highlights how digital payment systems have moved beyond urban centres and are reshaping business practices in small-town markets like Kalka. The findings confirm that awareness is nearly universal, and adoption levels are impressively high among shopkeepers. Education emerged as a key factor influencing adoption, as shopkeepers with higher educational qualifications were more likely to embrace digital tools, while age showed no meaningful influence. Importantly, the analysis also revealed that the benefits of adoption—such as reduced cash handling, faster transactions, and improved record-keeping—are widely recognised, contributing to smoother business operations and stronger customer satisfaction.

At the same time, the challenges cannot be overlooked. Shopkeepers consistently reported issues like transaction fees, security concerns, and customer reluctance, which limit the seamless integration of digital payments into everyday commerce. These barriers cut across age and education levels, showing that they are systemic rather than individual-level problems. The study also confirmed that shopkeepers who adopt digital payments view them more positively, reinforcing the idea that hands-on experience builds trust and confidence in technology. Overall, the results point to a clear message: digital payments are not just a passing trend but a transformative tool for small businesses. However, to unlock their full potential, targeted efforts are needed from policymakers, financial institutions, and technology providers to reduce costs, strengthen security, and raise both shopkeeper and customer awareness. By addressing these gaps, digital payments can serve as a catalyst for financial inclusion, business growth, and long-term economic resilience in small-town India.

FUTURE RESEARCH DIRECTIONS

This study provides useful insights into how shopkeepers in Kalka are adopting digital payments, but it also opens up pathways for further research. Future studies could expand the sample size and include shopkeepers from other towns and rural areas to capture regional differences and cultural influences. Comparative studies between urban and semi-urban markets may also highlight unique challenges that small-town shopkeepers face. Another direction would be to track the long-term impact of digital payment adoption on business growth, customer retention, and financial security. Since this study focused largely on current usage and perceptions, longitudinal research could show whether the benefits of digital payments are sustained over time.

Additionally, more detailed qualitative research—through interviews or focus groups—could uncover the personal stories, fears, and motivations behind adoption decisions, offering insights that raw numbers cannot fully explain. Future research might also explore the role of government incentives, training programs, and fintech innovations (such as AI-driven payment solutions, biometric authentication, or blockchain-based systems) in shaping adoption trends. Finally, a deeper look into customer perspectives in small towns could complement the findings from shopkeepers. Understanding how customers perceive convenience, trust, and security in digital payments would complete the picture and help design policies and tools that benefit both sides of the transaction.

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